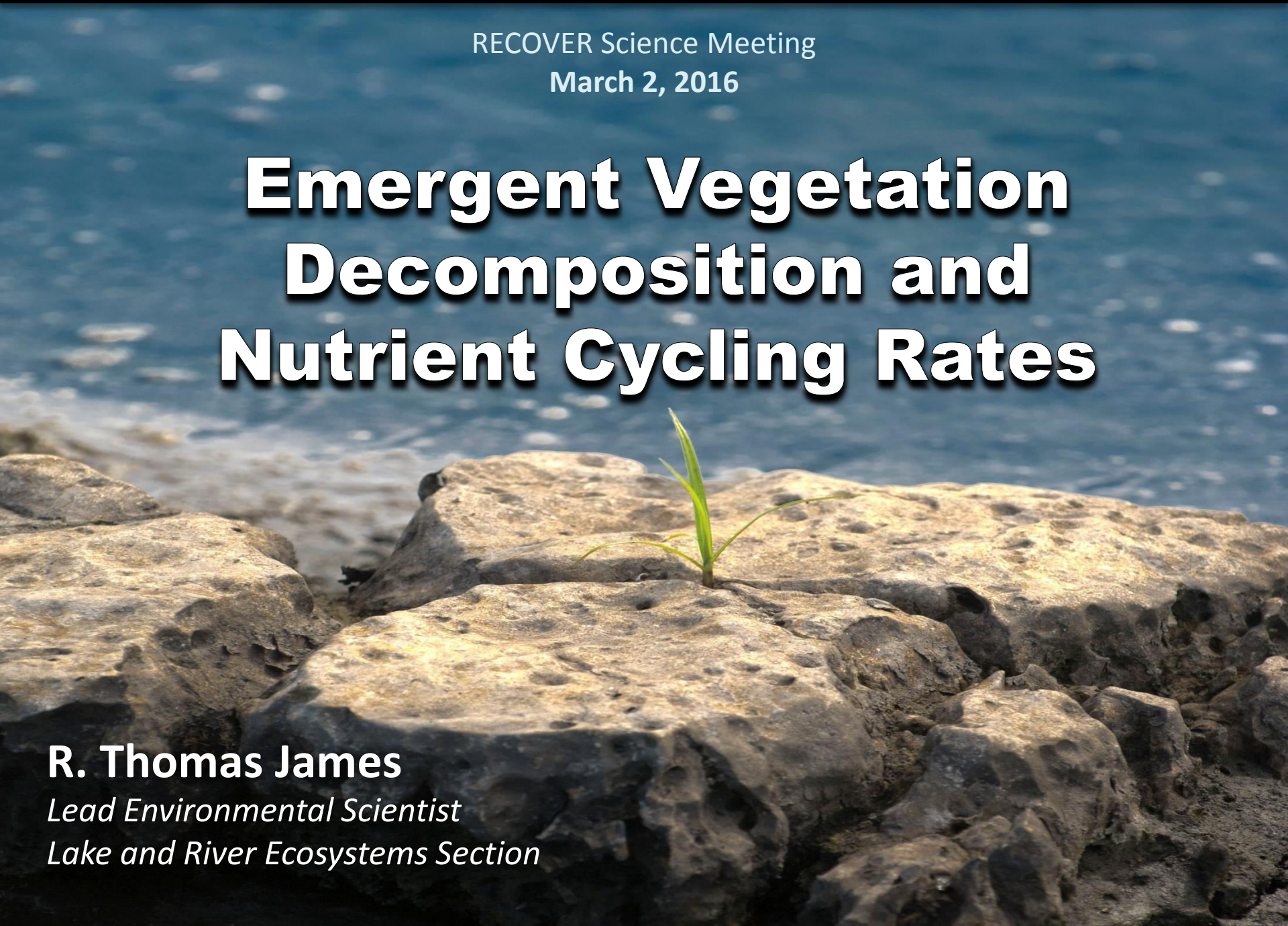
RECOVER Science Meeting

**March 2, 2016**

# Emergent Vegetation Decomposition and Nutrient Cycling Rates



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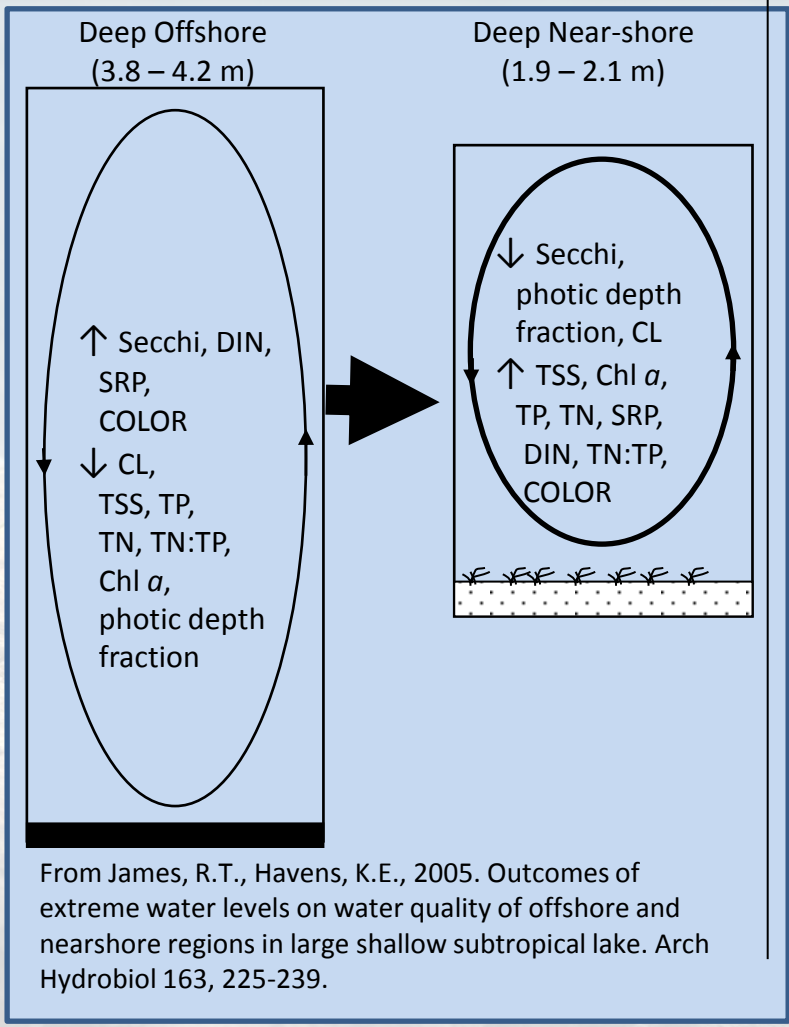
# Observations and a question

- Lake Okeechobee waters can rise quickly due to storm events
  - Uprooting of aquatic vegetation
  - Increased nutrient concentrations
- Could decomposition of litter be a significant source of nutrients?




From James, R.T., Havens, K.E., 2005. Outcomes of extreme water levels on water quality of offshore and nearshore regions in large shallow subtropical lake. Arch Hydrobiol 163, 225-239.

# Questions

- Is there a difference in decomposition of plant material under dry or submersed conditions in Lake Okeechobee?
- Is the mineralization the same or different than previously observed (Harris et al. 1995) 0.0018 to 0.0023 $d^{-1}$?
- Is there a difference in the decomposition rate between Cattail and Bulrush?

# Litter Bag Set up

- Collect fresh stems of Cattail (Typha) and Bulrush (Schoenoplectus)
- Weigh out approximately 10 g
- Enclose in litter bags
- Set half of litter bags in dry area, half in wet
- Follow mineralization (weight and C:N:P loss) over time (120 d)
- Time zero samples used to estimate initial dry weight for all samples

# Construction and Deployment

Plant material cut into six inch sections
Half of bags placed on dry ground in the Lake

Bags attached to frame that is anchored into the ground

# Construction and Deployment

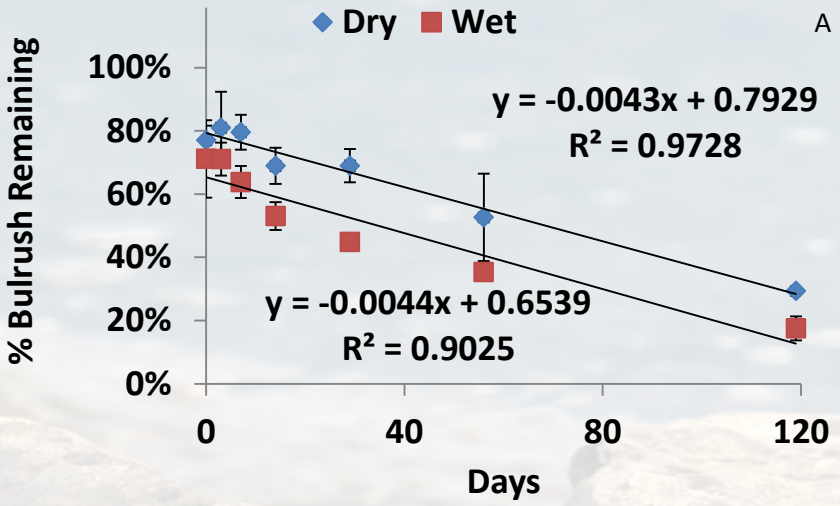
Other set of bags deployed in marsh underwater

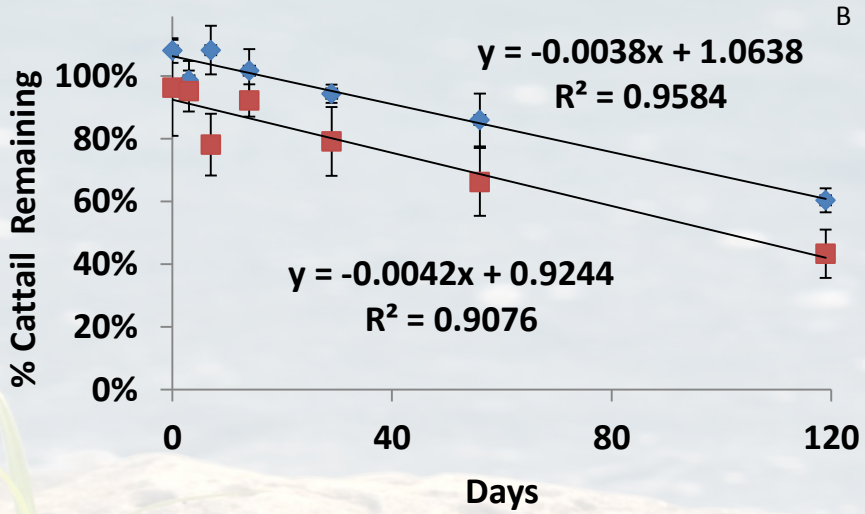
# Construction and Deployment

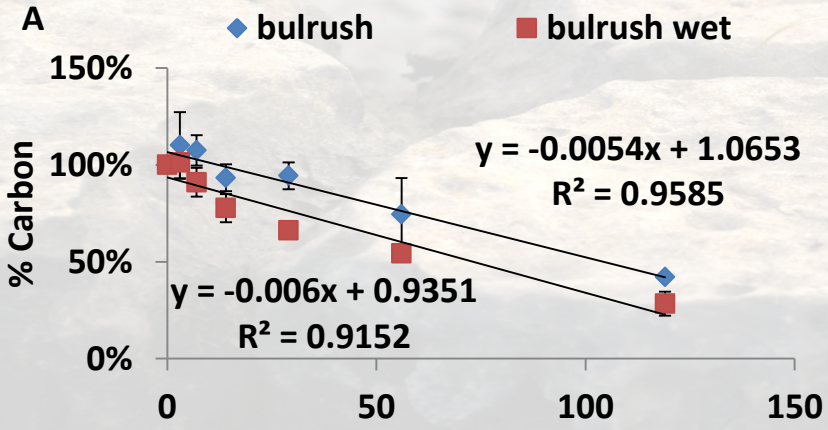
Other set of bags deployed in marsh underwater

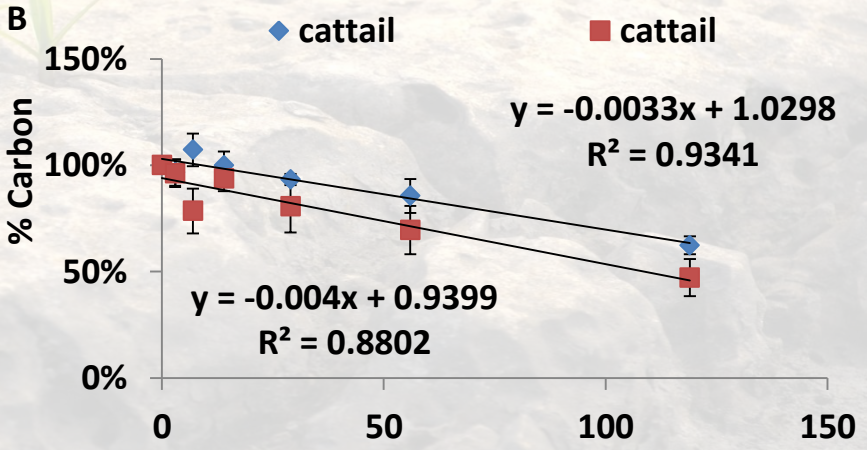
Triplicate bags retrieved at intervals of 0, 3, 7, 14, 29, 56 and 119 days

# Dry weight and carbon remaining

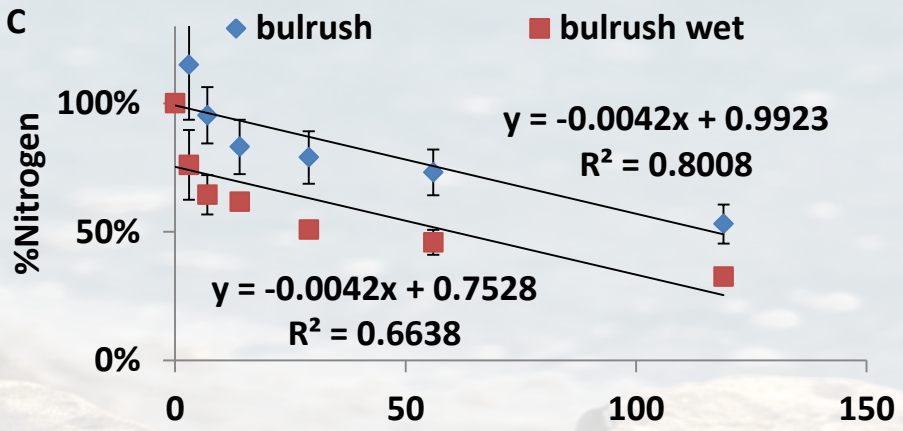


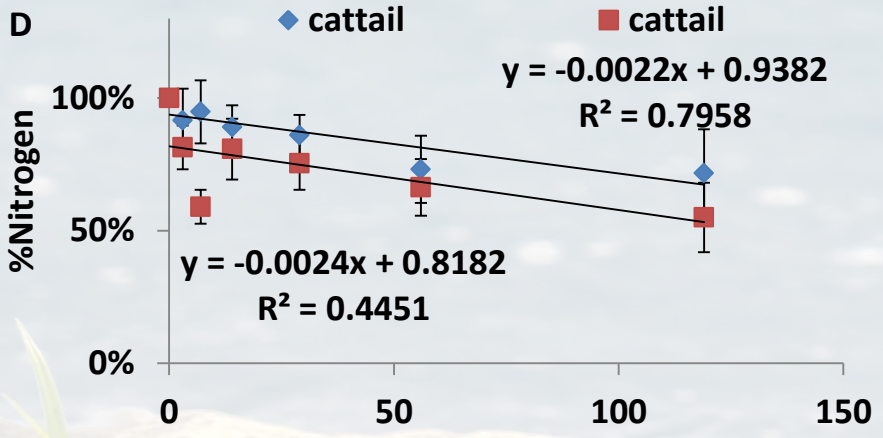



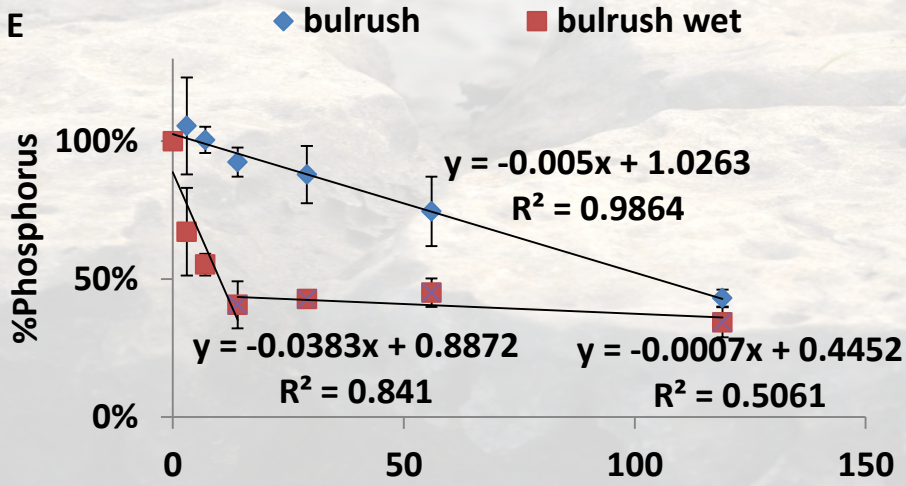



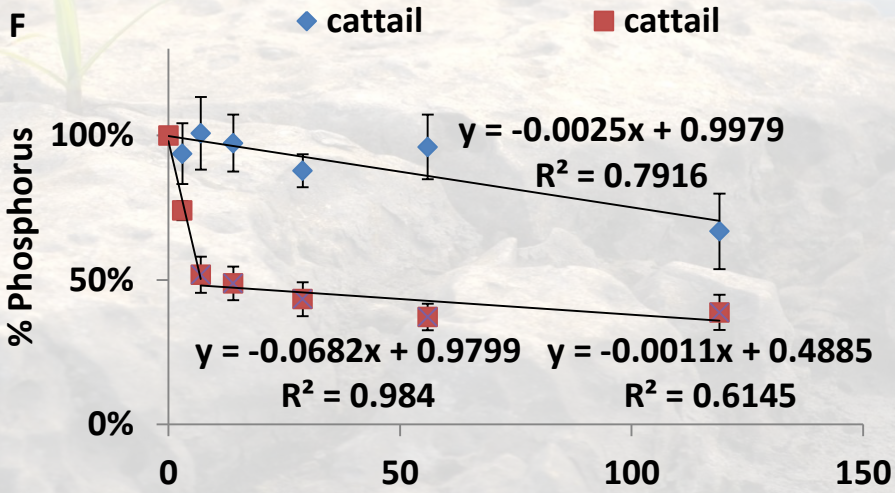



# Nitrogen and Phosphorus Remaining



# Summary

- Initial decomposition: wet > dry
- Wet conditions initial rapid removal of P
- After14 days decomposition rates in dry and wet conditions are very similar
- Mineralization rates (carbon) 0.006 to 0.003 $day^{-1}$
- Slightly higher than 0.0018 to 0.0023 reported by Harris et al. (1995)
- Decomposition: Bulrush > Cattail
- Is this a significant contribution to lake nutrient concentration?- (TBD)

# Questions?